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NEW APPROACHES TO TEACHING AND WORKING ON AIDS EDUCATION IN THE EDUCATION SYSTEM

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1. Introduction.

The spread of a new, more holistic and multidimensional concept of health along with advances in the field have given rise to growing social concern for healthcare and wellbeing. For this reason education for health (EfH) should be an important part of the science curriculum at all levels of education (Perea Quesada, 2004). However, the fact that there is such a wide range of topics to deal with under the heading of health - and given that it has a cross-sectional educational dimension - often means that less time is actually spent on the subject in the classroom. A number of studies based on school materials (textbooks) point to a lack of conceptual and methodological approaches designed to deal with EfH throughout compulsory education (Gavidia Catalán, 2003). Hence apart from nutrition education, which plays a greater role today, other relevant contents that fall under the headings of health or EfH are not always given the attention they deserve or are perhaps worked on only in the higher stages of education. Students therefore miss out on the chance of acquiring in earlier years a whole set of preparatory material, basic attitudes and skills that would improve their personal rules on prevention in general and their readiness to learn others. An example of these somewhat undervalued contents would be what are known as diseases with a high social impact, which can be looked at from two different angles: the health and prevention aspect and the awareness and social commitment aspect.

The very notion of diseases with a high social impact merits some preliminary reflection. If we consider the actual impact in terms of worldwide loss of life, then non-communicable diseases account for two-thirds of the total and are therefore the main cause of death (WHO, 2010). These diseases include cardiovascular diseases, diabetes, cancer, alcoholism and chronic respiratory diseases. All are associated with unhealthy lifestyles linked to the society in which we live. They all clearly have a social impact, are priority objectives in their own right when it comes to health policies dealing with prevention and wellbeing, and they deserve to be highlighted first. However, the second big group of diseases – communicable or infectious diseases – should be of fundamental concern both because of the high annual death rates they cause and also because the way they spread from person to person makes it all the more urgent to take action and teach people how they can be prevented. Added to this is the fact that they not only affect the adult population but also kill a great many children and members of other traditionally vulnerable groups (WHO, 2012).

Of those communicable diseases that have a high social impact, infection through HIV/Aids is an especially relevant case to consider. After its discovery in the 1980s, Aids rapidly became a priority health issue in western countries, more accustomed to keeping infectious diseases in check. Its close connections with blood, drugs and sexual practices, three elements that already have strong social connotations, aggravated the problem of transmission and brought a new, unexpected problem, calling into question the personal and sexual background of those infected.

Given HIV's connection with these widespread practices, Aids has been the subject of a whole range of actions aimed at prevention and to a lesser extent non-marginalization. In Spain, young people specifically were the target for numerous messages, campaigns, education programs and teaching materials designed for the purpose. Due to biomedical research and as a result of treatments and awareness campaigns, over the years the general rates of infection have been dropping worldwide (WHO, 2013) and in Spain (Díez Ruiz-Navarro & Díaz Franco, 2013) and the life expectancy of those affected has risen. This has most certainly helped to create a new image of HIV/Aids which is less dramatic and not associated with death, while at the same time eliminating the media pressure that magnified the problem in the early years. Sometimes it seems almost as if Aids, far from being an issue worthy of constant social concern, had been relegated to a position whereby it is remembered just once a year on December 1st, World Aids Day.

This chapter looks in greater detail at HIV/Aids as possible overlooked content for inclusion on the curriculum that fully meets the requirements for use as a core work area in primary and secondary school. Aids education must be continued because young people tend to have a lower perception of the risks inherent in their activities and personal relationships. Sometimes a more favorable environment and less educational pressure can turn falling rates of infection into rising rates, especially when the forms of contagion are so universal.

If we look for the most obvious presence of HIV/Aids in the Spanish education system, we find that it falls almost exclusively within the compulsory secondary education (ESO) curriculum, when sexual practices and addictions start to become more common. However, there is a whole range of ideas that could be applied in previous levels of education (pre-school and primary) that might not only encourage the development of specific competences involving prevention, once the time and age arrive, but would also have an effect on competences of a cross-sectional nature.

2. The discovery of HIV/Aids: a story with teaching possibilities.

The appearance of the first known cases of what would later be identified as Aids and all the subsequent historical process from then until today provide interesting work possibilities regarding both content and methodological approaches. It is not often that we get the chance to witness the appearance of an infection/disease with a high social impact, enabling us to follow it closely and find out about all the mechanisms deployed in its investigation and experience the effects it has on the social environment. The story of HIV/Aids can therefore serve as a core teaching area for analyzing in detail what is generally known as the scientific method and its stages, which in this case form research cycles (Gil Pérez et al., 1991), and could be used for teacher training in science and during secondary education (and even the last cycle of primary education). The first people affected and the first deaths from rare infections set alarm bells ringing between 1981 and 1982 (**Observation**). At the same time there was a huge amount of scientific exchange taking place between doctors and specialists in order to generate knowledge and keep up to date (**Updating and bibliographical enquiry**). Once it was established for certain what everyone was trying to discover (**Precise definition of the problem**), various agents were suggested as possibly being responsible (**Hypotheses**), while blood from patients was tested, cultures grown and autopsies carried out (**Experimentation**). The tests and cultures ruled out the first hypotheses (bacteria and protozoa) (**Results**) and the process was given a new direction, concentrating more on the literature (immunodepression, lymphotropic viruses and feline leukemia) and coming up with new candidates (**Design review, proposal of new hypotheses and reformulation of the problem**). By obtaining new samples and using other techniques for identifying infectious agents (**New results and technology**), the team led by Luc Montagnier was able to propose that LAV, later known as HIV, was the agent behind Aids (**Conclusion**). This suggestion was immediately disseminated throughout the scientific

community (1984) (**Communication**) and gave rise to a succession of questions and challenges (cycle of infection, immune response, treatments, vaccines, etc.) (**New questions**), triggering new research cycles, one of which we are in now. Hence students would approach the scientific work via a real case, involving themselves in it and being part of its stages. Making students understand the way people work in science is an important objective in science education, and it is still difficult to achieve this in the classroom. Not only would this process enable specific competences relating to the story of the discovery of HIV to be developed, it would create a favorable environment for other important generic competences (González Ferreras & Wagenaar, 2003) such as the ability to learn, to deal with new situations, to identify, consider and solve problems, etc. Due to the nature of the subject, one possible strategy to use in this situation would be the *case study method*, described as simulation techniques for teaching (Taylor, 1991), where students need to gradually gather information about each stage of the story and reconstruct it through group discussion.

The story of the discovery of HIV/Aids has another series of strengths for science education and for building up student competences. One of these involves the processes of marginalization and social exclusion generated by fear of possible contagion. The history of medicine in relation to diseases is full of episodes based on myth, fear and ignorance of science that find their final expression in processes that marginalize the sick and affected. In the case of Aids, when the first deaths occurred in 1981 due to a rare form of pneumonia caused by the fungal pathogen *Pneumocystis carinii* (now known as *Pneumocystis jiroveci*), the protocol for dealing with the infected and the sick was evocative of that used in times of plague (Fineberg, 1988). Similarly the appearance of other deaths among homosexual males in the US due to a rare form of cancer (Kaposi's sarcoma) unleashed a worldwide campaign against the gay population that gave rise to numerous cases of exclusion. Getting closer to these events in the classroom could involve videos and films from the time that showed the key moments in these stories, as part of the case study approach. Apart from case studies, another strategy for getting a closer look at the processes of marginalization due to Aids would be to read and discuss texts, articles, biographies and even news stories of the time, and possibly to study the lives of famous people who have died (singers, sportspersons, etc.). Generally speaking this type of reading, when well organized and managed by the teachers, has for years been considered an effective way of approaching science (Mateos Jiménez, 1992; Sanmartí i Puig, 2010; Oliveras Prat, Márquez Bargalló & Sanmartí i Puig, 2012). Working with these contents in connection with non-marginalization would make it easier to develop cross-sectional competences such as social responsibility, citizen commitment and valuing and respecting diversity. The nature of science and science-technology-society (STS) relationships are other aspects that could be used to analyze the appearance and development of HIV/Aids. In the former, the aim would be to learn that science is a human activity and that the stories behind discoveries are sometimes peppered with self-interest, jealousy, personal controversy and so on. Again, reading biographies and newspaper articles from the period would be a useful resource. Of the many possible examples to choose from, students could talk about the rivalry between Wallace and Darwin on the subject of evolution or about the controversy that raged between 1983 and 1984 regarding exactly who discovered HIV, Gallo or Montagnier (Carrasco Llamas, 1996). In the case of STS relationships, it is advances in technology that make new biomedical findings possible, and these result in better treatments, new vaccines, etc. Laboratory techniques have sometimes enabled the taxonomic placement of some of the relevant pathodens to be changed, for example. This was the case with the agent that causes the pneumonia indicative of Aids (*Pneumocystis carinii*), which has not only had the specific epithet of its scientific name changed but has also gone from being considered a protist in the 1980s to a fungus today, which naturally changes its treatment strategy.

3. Educating about HIV/Aids at all levels of education.

The basic ways by which Aids is transmitted require certain practices that can be avoided if people are previously given effective relevant education. It is no surprise, therefore, that school would be the right place to start programs on Aids awareness and prevention. In the past this educational priority was endorsed by various international organizations and, in Spain, was included in various documents such as *Cross-Sectional Topics* published by the Ministry of Education and Science (1992; Morón Marchena, 1997). The first step in classwork consists of finding out the students' conceptions and their knowledge of and attitudes toward the infection, the disease and those affected. This line of investigation was common in the late 1980s and 1990s (Weinstein, Rosen & Atwood, 1991; Herrero Alarcón, Díaz Santos & Mansilla López, 1996). Today, although there are a number of papers that have returned to the subject (Dávila et al., 2008; Siqueira et al., 2013), it no longer occupies center stage for researchers. The same thing happens with educational materials and prevention programs, previously endorsed by public institutions and foundations (examples in García Gurucharri, 1989; Fundación *La Caixa*, 1995) but over the last few years aimed more at collecting experiences, educational interventions and programs concerning sex education, almost always in countries still heavily exposed to the virus (Givaudan & Pick, 2005; Halabi et al., 2013). There is therefore a lack of new, more up-to-date research informing us about the knowledge, beliefs and attitudes not only of secondary school and university students, but also of pupils in the final years of primary school, where a start should already be made on sounding out schoolchildren. All this should be accompanied by proposals for teaching and intervention.

It is essential to review the educational aspects that can be dealt with using HIV/Aids. This will be the basic aim of the chapter, which will try to answer two specific questions: *What contents are appropriate for each age?* and *What basic guidance can be given for working with these contents?*

3.1. Core work areas in education on HIV/Aids.

It is pointless talking about education on HIV/Aids in primary and secondary school if we ignore the fact that teachers have to be trained in the subject first. It is essential that HIV/Aids should also form part of the natural and social sciences curriculum in Faculties of Education and Teacher Training Centers and be dealt with using innovative approaches and methodologies, as argued in this chapter. Before analyzing the what and the how for each level of education, it would be a good idea to establish the general points of reference into which this content could be divided. Later, using these points as a basis, the most appropriate sections to apply in classes ranging from non-compulsory education (pre-school) up to secondary, higher secondary and university education can be selected. Three large core areas can be proposed upon which to gradually build up the content at each educational level: Infection/Disease, Prevention and Social Problems (Marginalization).

Infection/Disease would enable us to organize the learning into at least four large sections: (1) central elements (virus, defensive cells, infection cycle, opportunist diseases, etc.); (2) possible origin of the virus; (3) clinical evolution of the infection; and (4) treatments and possible vaccines. **Prevention** can be broken down into (1) transmission and contagion, (2) high risk practices, (3) screening tests and (4) statistics. **Social Problems** involves two main core work areas: (1) questions relating to the vocabulary of those affected (the infected, the seropositive, the sick, etc.) and (2) the attitudes and behaviors of the students and society toward the infection and the disease.

3.2. Pre-School Education.

In the pre-school stage, learning can begin with the fundamentals of protection that will be useful for the future. The key would be blood and hygiene, one of the three elements of transmission in adults. This approach would fall within the framework of the human body and health and could be worked on along with a general process of prevention measures. It would be essential to design activities dealing with the basic rules of hygiene (bathroom, break times,

etc.) and also with not sharing personal items (combs and hairbrushes, toothbrushes, etc.) or food and candy that has previously been in contact with saliva. This would be accompanied by other basic rules such as not walking barefoot so as to avoid cuts, not touching garbage, etc. Blood would be presented as the vehicle in which part of our defenses live (with the very useful analogy of the defense system being like an army) and where sometimes there may also be microbes (an appropriate term for pre-school). Some simple hygiene activities related to blood (no licking of wounds, basic cleaning of wounds, nose bleeds, etc.) could be introduced. Resources such as stories, simple simulation games, dramatizations, puppet plays, short demonstrations by health workers and so on can be used at these early ages. Work could begin on questions of non-marginalization based on activities that develop cross-sectional competences related to social justice - equality, interculturality and non-discrimination - using some of the resources already mentioned.

3.3. Primary Education.

During the 1st cycle (ages 6-8) the contents and approaches of the pre-school stage could be intensified and consolidated. Looking at the problem as a whole and working on competences would be basic design components, just as in pre-school. The health-blood pairing could be a central work core area. This would make it possible to work on the communication competence by identifying new terms (red blood cells, white blood cells, etc.) which could be extended to cover more new terms in the 2nd cycle (ages 8-10). In the 3rd cycle (ages 10-12), especially in the final year, the immune system could become the core work area for HIV/Aids, enabling concepts such as antigens, antibodies, infected person, etc. to be more clearly defined. For the mathematical competence, in the 1st cycle we could work on simple groupings of microbes and defensive cells and then introduce basic statistics on the numbers of infected and sick, work with percentages, interpretation of certain graphs, etc. by the 3rd cycle. For the competence in knowledge of and interaction with the physical world, we could find out (in the early cycles) the ways in which microbes (blood, saliva-cough, etc.) infect us and how to prevent it. Upper years could see the introduction of a general outline of the HIV cycle. Students could be given a more detailed view of the concept of infection, with the emphasis on the contagion-infected-sick sequence. Bearing in mind the level students have reached in the 3rd cycle, four basic elements could be highlighted: macrophages, T4 lymphocytes, T8 lymphocytes and B cells. This classification could later enable us to explain how the virus lives inside and kills the controllers of the immune system as a whole (T4). As far as social and citizen competence is concerned, activities encouraging solidarity could be designed for all cycles. All these activities would go more deeply into the areas of non-marginalization and social exclusion, fostering equality in matters of gender, multiculturality, ethical commitment, etc., working on poverty in relation to countries that suffer more diseases, specifically HIV/Aids, and looking at less advantaged collectives and real life in Africa: medicines, vaccines, etc. We also have to take into account the appearance of sex education in each cycle, which would provide an opportunity to deal with emotional competence. In the 3rd cycle, sex education could also be worked on from the standpoint of citizen competence and would be presented as a way of helping to avoid contagion from the three sources already mentioned. As regards the competence of autonomy and personal initiative, the setting of simple problems on how to avoid diseases, improve health, etc. could be a strategy adapted for use at each level. We would also develop the learning-to-learn and digital competences in each cycle of primary education by presenting a type of puzzle to be solved in relation to HIV/Aids, using questions such as *What would we like to know about blood?* (in early cycles) and *What would we like to know about diseases?*, etc. In the final cycle, the origin of HIV would be an absorbing element that would also lead to work on the area of myths and beliefs. To strengthen the students' interest in learning, there could be discussions on the true source of the virus and its transfer to humans (infection through handling chimpanzee blood) versus all the other possible sources put forward on the internet, thereby also encouraging cross-sectional competences related to the ability to investigate, information sources, criticism, self-criticism, etc. Finally, there are various possibilities for developing cultural and artistic competence in the areas of blood, hygiene and health. In the early cycles these could range from

picture stories through to drawings of bad habits, the making of simple puppets for plays, etc., while in the final year, given their age and interests, it could be motivating for students to analyze the work of artists or singers that have died of Aids or for them to form groups to create posters or advertising campaigns about prevention and non-marginalization using slogans and different materials for dissemination.

3.4. Secondary Education and Higher Secondary Education.

We believe that these education cycles should continue and reinforce the work done on HIV/Aids in the 3rd cycle of primary. More scope should be introduced for certain contents (sex education, drug addiction, contagion and high risk practices, treatments, vaccines, etc.). Specific vocabulary would need to be used to describe the basic concepts relating to the virus and the infection cycle. The components of the immune system and the specific function of each could be worked on in greater detail. We could also make the most of HIV detection tests to look more deeply into simple immunity mechanisms and competences related to scientific work (rigor, safety, checking, patience, etc.). We would also be able to study the differences between treatments and possible vaccines and analyze particular lines of current research aimed at improving or designing both these things, thereby developing the competences of learning and keeping oneself permanently up to date. Prevention would involve teaching these adolescents the correct use of contraceptive methods, given that this is a sexually transmitted disease.

4. Final Ideas.

HIV/Aids is a sufficiently important content area to be worked on in primary and secondary schools, not only because it involves learning about health, but also because it provides a whole raft of possibilities for introducing activities that would encourage numerous specific and cross-sectional competences, specifically the nine basic competences that are worked on with school children (including emotional competence in the curriculum of Castilla-La Mancha, Spain). This is a disease that has a definite social impact and that should not be subjected to the media impact it receives at any given moment. We need to overcome the idea that identifies it as a disease that has now become *chronic* or that only surfaces in poor or developing countries and give it the attention it deserves in our classrooms. Education on HIV/Aids in all its aspects should begin from the earliest ages, providing basic rules of hygiene to accompany people throughout their lives. Looked at in this way we would undoubtedly strengthen the commitment to prevent these and other communicable diseases that disproportionately affect young people who take up certain practices that could be high risk. We still have to stress the fact that people should not lower their guard when it comes to prevention (Díez Ruiz-Navarro & Díaz Franco, 2013) and this means that HIV/Aids needs to regain the importance it once had in the area of sciences. New teaching materials need to be designed and the content should be included in textbooks as a reference to be worked on. Neither should we forget its importance in teacher training at university, where, as one of the subjects taught in natural and social sciences and other areas, it would be included in the training of teachers and social educators.

In the classroom we need to look at diseases that have a high social impact as a form of social commitment, as a window bringing us closer to the real problems of other people, often the most disadvantaged and excluded. Education on HIV/Aids in primary and secondary schools is education on health and science. Most of all, however, it is education on citizenship, ethical attitudes and values, all of which are aspects no teacher can ignore if they are committed to improving their pupils.

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